RoadMap

Air Quality Mangement



EARTH SCIENCE RESEARCH **DECISION SUPPORT INPUTS** GOALS State 2 ESMF (c. 2015): · Robust emissions control planning · Routine warnings of pollution events Multiple-day air quality forecasts Accurate pollution forecasts updated Simultaneous high-time & space resolved pollutants within day. Reduced hospital visits from (O3, CO, NOx, SO2, HCHO, aerosols); Night time extreme events. Improved NAAQS chemistry & transport, Feedbacks betw, aerosols, O3, planning - fewer non-attainment areas H₂0, climate. Quantify LRT in regional pollution. Targeted mitigation for severe episodes. Improved capabilities NPP-NPOESS - ozone trend & aerosols. Global trop. Clear Skies NOx/SO₂ Trading Program. Longer winds. Geographic evol. of trop. O₃ & aerosols. Lightning NOx emission inventories. Trop. mixing lead-time on source & destination of ozone and to air quality aerosols. Alerts to re-route airplanes. Alerts to managers to assess, & BL interaction. Urban-scale heat flux. High-res. hospitals to expect specific symptoms. Ozone plan & implement soundings. attainment areas. emissions control CloudSat & CALIPSO - cloud profiles. Accurate Forecasts of beginning & length of annual strategies, policy, & energy & water in MM5. Vertical levels in lower "pollution season." Improvements from achievable SIPs - reduced haze, improved visibility, troposphere. Models incorporate radiative forcings air quality forecasts. Land-atmos interactions. Chem.-transport models. cleaner water, reduced lost work/school days. Support for goals of Clear Skies initiative. Science-AURA - SO2, NOx, NH3 and aerosol products & based attribution of source emissions. States IMPROVE network, INTEX-West, NH3 emissions quantify voluntary stationary emission reductions. factors; MM5 & assimilation of surface moisture, heat Longer-term AQI forecasts. UV-B notice. capacity, insulation. Nested model developments. Support 2004 NOx SIP call. State justify & EPA AURA trop. residuals (O3, NO2, SO2, HCHO); NRT corroborates claims for foreign-born pollution waivers. Annual EPA analysis of worst 20 pollution events for NOx & VOC emission inventories (top-down, bottom-up): O₃ assimilations in CMAO: 3-D global trends. Extend PM/O₃ forecasting to rural areas. **Enhanced Decision Support** trop, chemistry in GEOS-CHEM. States assess emissions control options & emissions INTEX continental inflow-outflow; Global-tostrategies to build attainable SIPs and improve air quality, regional models (RAQMS, GMAO) - prototype BCs in CMAQ; Pollution trajectories & BL public health & economic development opportunities. deposition of LRT of aerosols. PM network States claim waivers for foreign-born pollutants Aerosol transport loops in EPA AIRNow/Air Quality Index (AQI) MODIS AOD, MOPITT CO, TOMS ozone for regional forecasts. Support EPA-developed tools for residuals - correlate to EPA ground state/locals on regional haze. Evaluate exceptional events for effects on NAAQS violations. EPA PM transport rule making. measures. Large scale transport of aerosols. Assimilations for B.C.s in models. (State 1) CMAQ & AIRNow/AQI (c. 2003) EARTH OBSERVING MISSIONS 2005 2007 2009

Where we are now

Use of Earth science observations on case-by-case project basis

Regional and intercontinental transport of air pollutants identified and research on inflow/outflow to regions

Prototype use of MODIS aerosol depth in air quality forecasts and ozone residuals for air quality planning

Where we plan to be

Routine use of Earth science products in decision tools for air quality forecasting, planning, and compliance

Use of Earth science data and model outputs and predictions supporting scenario assessments for policy making and management.

Benchmark reports on performance of products from at least 7 sensors and models into at least 5 separate air quality issues and decision tools

2004 — 2012

